Research and Technologies for Aerospace Propulsion Systems 2 (RTAPS 2)

Industry Day

Susan Johnson

January 22, 2015

Important Points

- Please mute phones
- In the event of a discrepancy between this presentation and the solicitation, the SOLICITATION TAKES PRECEDENCE
- There will be no verbal questions taken during this presentation
- The one-on-ones have been cancelled and will not occur for this solicitation.
- Questions/Answers in response to draft RFP will be posted to FEDBIZOPPS.
- Questions and Answers to Industry Day will be posted to https://rtaps.grc.nasa.gov/rtaps2/ and to FEDBIZOPPS

Important Points

- All questions must be submitted in writing to ensure accuracy and minimize confusion.
- For those attendees using WebEx, written questions may be submitted using “chat” and sent to Jana Van Horn
- For on-site attendees, written questions may be submitted on index cards provided
- Questions may also be submitted by e-mail to bernadette.j.kan@nasa.gov

NASA Glenn Research Center

Lewis Field (Cleveland)
350 acres
1626 civil servants and 1511 contractors
66% of the workforce are scientists and engineers

Plum Brook Station (Sandusky)
6500 acres
11 civil servants and 102 contractors

Industry Day Agenda

- Objective of RTAPS 2 Industry Day
- Background
- RTAPS 2 Technology Areas Overview
- RFP Overview
- Proposal Preparation
- Task Order Process
- Questions

Objective of RTAPS 2 Industry Day

The objective of the industry day is to provide

- potential bidders a consistent understanding of the RTAPS 2 intent and content
- to provide potential bidders a forum to submit their questions.

BACKGROUND

Background – What is RTAPS 2?

Research & Technology for Aerospace Propulsion Systems 2 (RTAPS 2) Contract

- RTAPS 2 is a competitive task-order contract instrument for the research, design, and development of advanced aerospace propulsion technologies and communications.
- RTAPS 2 is structured to support NASA's on-going, long-term aerospace research programs addressing a wide variety of propulsion and communication objectives.
- RTAPS 2 is **Not** a new Program or Project.

Background - What is RTAPS 2?

Research & Technology for Aerospace Propulsion Systems 2 (RTAPS 2) Contract

- Follow-on to RTAPS contract awarded in 2010
- Competitive Negotiated Acquisition (FAR Part 15)
- Multiple Contract Awards, Indefinite-Delivery/Indefinite Quantity (IDIQ)
- Work will not generally be at a NASA site; the work is meant to be done at the contractor's site
- Scope – All NASA Centers and Headquarters

NASA Glenn Aeropropulsion

Develop and demonstrate advanced engine technologies that enable revolutionary improvements in emissions, noise, capacity, and safety with increased operating efficiency and reduced fuel burn.

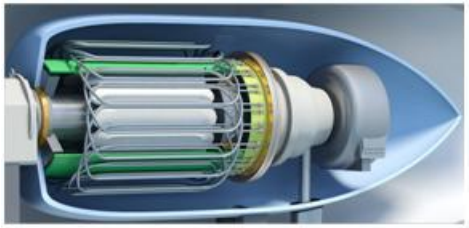
Support NASA ARMD Strategic Thrusts

Ultra-Efficient Commercial Vehicles
- Pioneer technologies for big leaps in efficiency and environmental performance

Transition to Low-Carbon Propulsion
- Characterize drop-in alternative fuels and pioneer low-carbon propulsion technology

Innovation in Commercial Supersonic Aircraft
- Achieve a low-boom standard

Materials and Structures



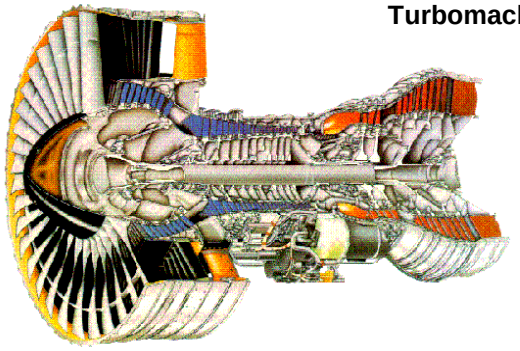
Variable, Combined and Hybrid Engine Systems

Advanced Combustors and Alternative Fuels

High Power Density Engine Turbomachinery

Inlets

Low Noise Propulsion Technologies



Nozzles

Engine Icing

Concept Development and System Studies

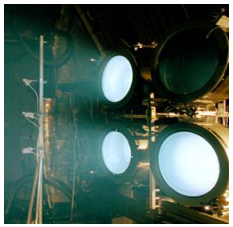
Instrumentation, Sensors, Controls and Intelligent Systems

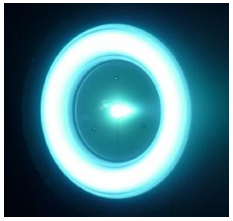
In - Space Propulsion Systems and Technologies

Electric, Chemical, & Thermal Propulsion Systems

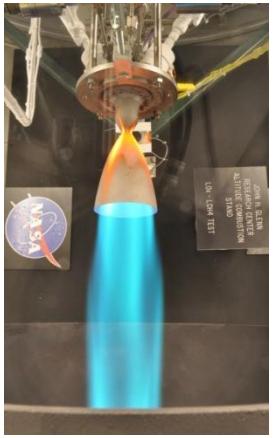
MPCV Crew and Service Module propulsion system development

Solar Electric Propulsion (SEP) system development

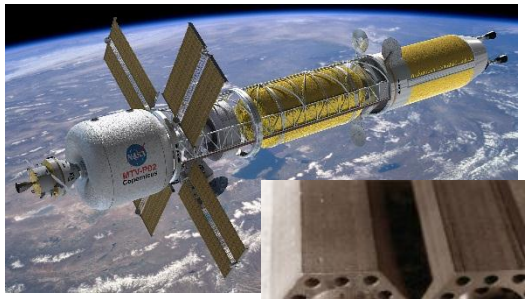




Ion and Hall propulsion research and technology



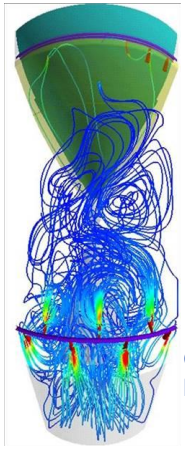
LOX/Methane and advanced chemical rocket technology



Nuclear Thermal Propulsion (NTP) research, technology and system analysis

Propellant & Cryogenic Fluid Management Systems

Thrust Vector Control (TVC) test



CFD analysis of purge and hazardous gas systems

Cryogenic storage and fluid handling systems

Supporting the NASA Science Mission Directorate, Space Technology MD, Human Exploration and Operations MD

Aeronautical Communications

Aeronautical Communications, Navigation, Surveillance and Information (CNSI) Systems

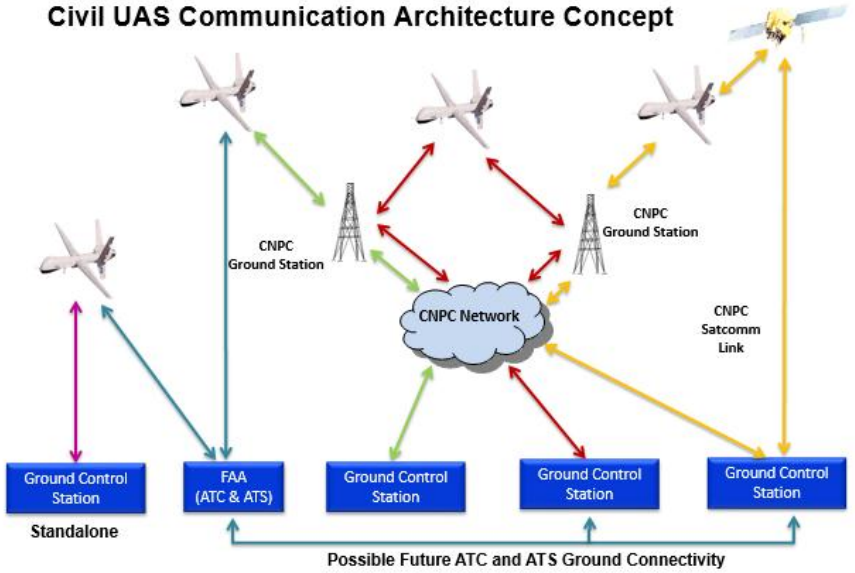
Supporting UAS integration into the NAS and SmartNAS Projects

Support NASA ARMD Strategic Thrusts

Safe, Efficient Growth in Global Operations
- Enable full NextGen and develop technologies to substantially reduce aircraft safety risks

Assured Autonomy for Aviation Transformation
- Develop high impact aviation autonomy applications

- Communications Architectures (including beyond line-of-sight)
- Secure, high-rate wireless communications
- Airport Surface Operations
- Modeling and Simulation/Tech Demos
- Spectrum and Link Analysis
- Enabling components and electronics



Space Communications

Enable Future NASA Missions with New Communication and Navigation Technology that Enhances their Science Return

Space Communications and Navigation (SCAN) Program is our chief customer:

- Integrated network architecture that is intentionally ***capability-driven*** and will continue to evolve
- Supports ***human*** and ***robotic*** missions
- ***Infrastructure*** across space
- Highest feasible ***data rates***
- Internationally ***interoperable***

➢ Providing space communications for lunar and mars missions

Supporting Technologies

Optical Communications
Antenna Arraying – Receive and Transmit
Advanced Antenna Advanced Networking
Spacecraft RF Transmitter/Receiver
Software Defined / Cognitive Radio
Spacecraft Antenna
Spectrum Efficient
Ka-band Atmospheric Calibration
Position, Navigation, and Time
Space-Based Range
Uplink Arraying




RTAPS 2 TECHNOLOGY AREAS OVERVIEW

RFP Overview -Technology Areas

RTAPS 2 is divided into Technology Areas

Technology Area 1: Air Breathing Propulsion Technology

Technology Area 2: Space Propulsion

Technology Area 3: Aeronautical Communications

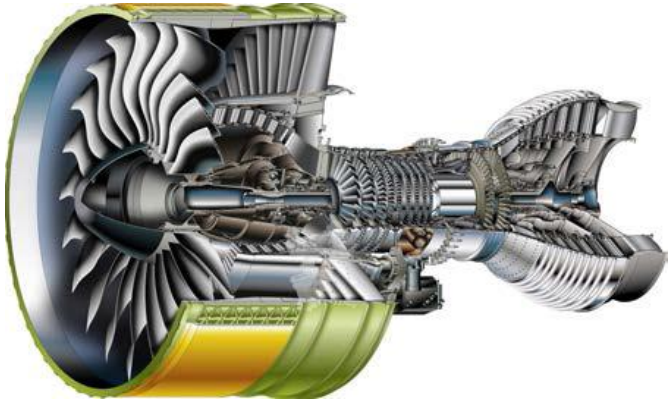
Technology Area 4: Space Communications

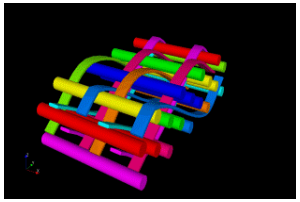
Technology Area 1: Air Breathing Propulsion Technology

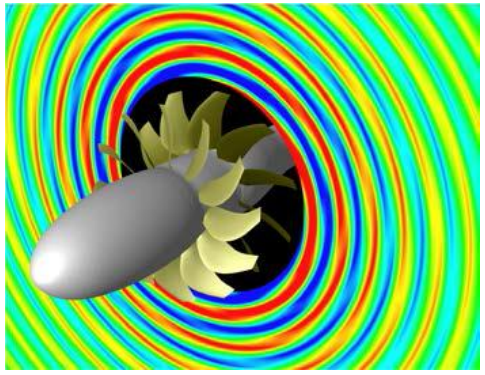
Overview: *Development and demonstration of advanced engine technologies that will enable revolutionary improvements in emissions, noise, capacity and safety with increased operating efficiency and reduced fuel consumption.*

Elements of Tech Area 1 includes:

- Concept Development and Systems Studies
- High Power Density Engine Turbomachinery
- Advanced Combustors and Alternative Fuels
- Low Noise Propulsion Technologies
- Inlets and Nozzles
- Variable, Combined and Hybrid Engine Systems
- Engine Icing
- Materials and Structures
- Instrumentation, Sensors, Controls and Intelligent Systems





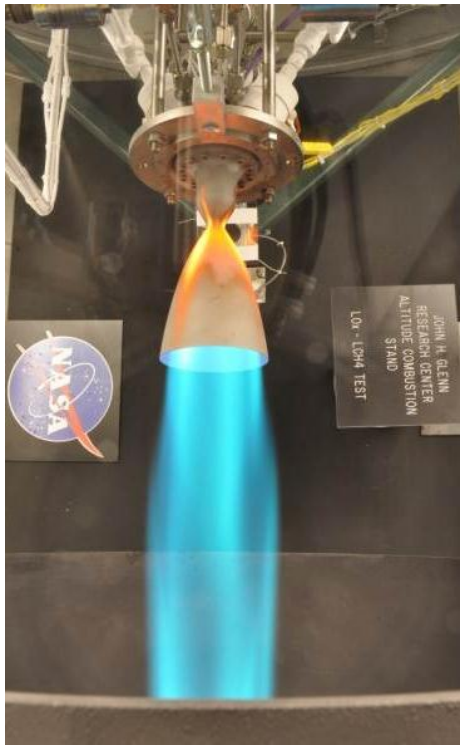


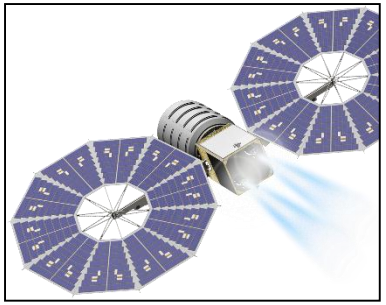
Technology Area 2: Space Propulsion

Overview: *Conduct studies, as well as research and development of space propulsion technologies to enable missions with higher performance, reduced cost, improved operability/reliability, and improved safety.*

Elements of Tech Area 2 includes:

- Propulsion System Design and Trade Studies
- Liquid Engine Systems
- Propellant Systems
  - Cryogenic Propellant Systems
  - Noncryogenic (Earth-storable) Propellant Systems
- Electric Propulsion
- Rocket-Based Combined Cycle Propulsion Systems
- Advanced Propulsion Systems



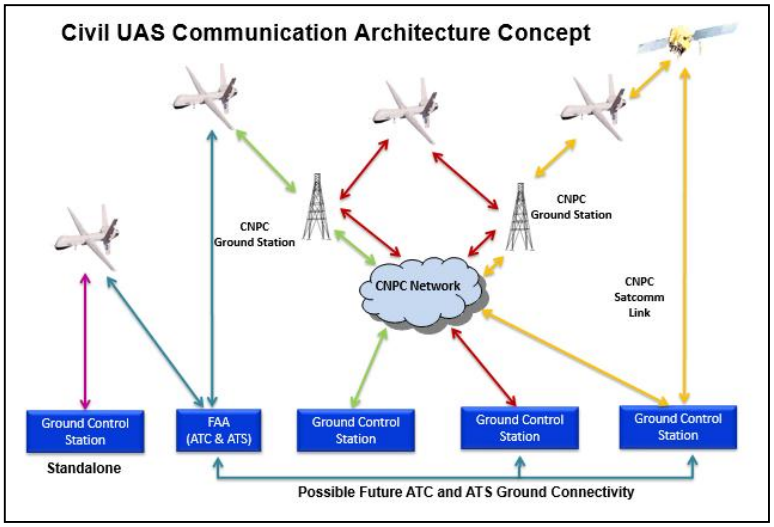


Technology Area 3: Aeronautical Communications

Overview: *Research, analyze, develop and demonstrate advanced aeronautical communications technologies for future civil aviation communications for Communications, Navigation, Surveillance and Information (CNSI) Systems.*

Elements of Tech Area 3 includes:

- Research and Analysis
- Concepts and Architectures
- Components and Subsystem Development
- Testing and Demonstration

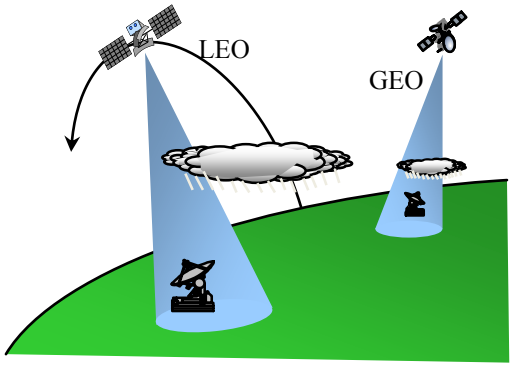


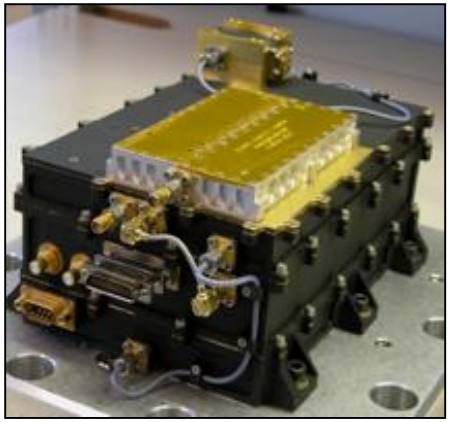
Technology Area 4: Space Communications

Overview: *Research, analyze, develop and demonstrate advanced space communications technologies for future NASA communications needs.*

Elements of Tech Area 4 includes:

- Studies
- Space Radios
- Disruptive (or Delay) Tolerant Networking
- Flight and Ground Communication Terminals





RFP OVERVIEW

RFP Overview- Statement of Work

The Scope of contract is described in Section C (SOW), and includes the Technology Areas and elements that make up the scope of the work permitted under the contract.

Technology Area 1: Air Breathing Propulsion Technology

Technology Area 2: Space Propulsion

Technology Area 3: Aeronautical Communications

Technology Area 4: Space Communications

RFP Overview- Statement of Work

The **Elements** of the SOW Technology Areas are:

Technology Area 1: Air Breathing Propulsion Technology

- **Element 2.1.1** Concept Development and Systems Studies
- **Element 2.1.2** High Power Density Engine Turbomachinery
- **Element 2.1.3** Advanced Combustors and Alternative Fuels
- **Element 2.1.4** Low Noise Propulsion Technologies
- **Element 2.1.5** Inlets and Nozzles
- **Element 2.1.6** Variable, Combined and Hybrid Engine Systems
- **Element 2.1.7** Engine Icing
- **Element 2.1.8** Materials and Structures
- **Element 2.1.9** Instrumentation, Sensors, Controls and Intelligent Systems

Technology Area 2: Space Propulsion

- **Element 2.2.1** Propulsion System Design and Trade Studies
- **Element 2.2.2** Liquid Engine Systems
- **Element 2.2.3** Propellant Systems
- **Element 2.2.4** Electric Propulsion
- **Element 2.2.5** Rocket-Based Combined Cycle Propulsion Systems

RFP Overview- Statement of Work

The **Elements** of the SOW Technology Areas are (continued):

Technology Area 3: Aeronautical Communications

- **Element 2.3.1** Research and Analysis
- **Element 2.3.2** Concepts and Architectures
- **Element 2.3.3** Components and Subsystem Development
- **Element 2.3.4** Testing and Demonstration
-

Technology Area 4: Space Communications

- **Element 2.4.1** Studies
- **Element 2.4.2** Space Radios
- **Element 2.4.3** Disruptive (or Delay) Tolerant Networking (DTN)
- **Element 2.4.4** Flight and Ground Communication Terminals

RFP Overview - Solicitation Process

Proposers may bid on one or more Technology Areas

- All **Elements** under a Technology Area must be addressed.
- Each Technology Area will be evaluated and scored independently.
- Successful Offeror may be awarded one or more Technology Areas depending on areas proposed.

RFP Overview - Contract Type

- Indefinite Delivery/Indefinite Quantity (IDIQ)
  - Task Orders
    - Fixed Price
    - Cost Reimbursement
    - Cost Sharing

RFP Overview - Contract Awards

- Multiple contracts to be awarded per Technology Area
  - Contractor will be eligible to compete for future task orders in the area or areas in which contractor received an award.
  - Example: If contractor is awarded for Technology Areas 1 and 3, contractor cannot compete for tasks in Technology Areas 2 and 4.

RFP Overview – Maximum Contract Value

Technology Area	Estimated **Maximum** Value
• Air Breathing Engine Technology	$50M
• Space Propulsion Systems	$30M
• Aeronautical Communications	$15M
• Space Communications	$10M

$ value revised after draft posting

- It is anticipated that multiple contracts will be awarded as a result of this RFP. Maximum value is dependent on the number of technologies selected, but cannot exceed $105M.
- 20% Contract clause H.23 Surge clause included to cover within scope requirements

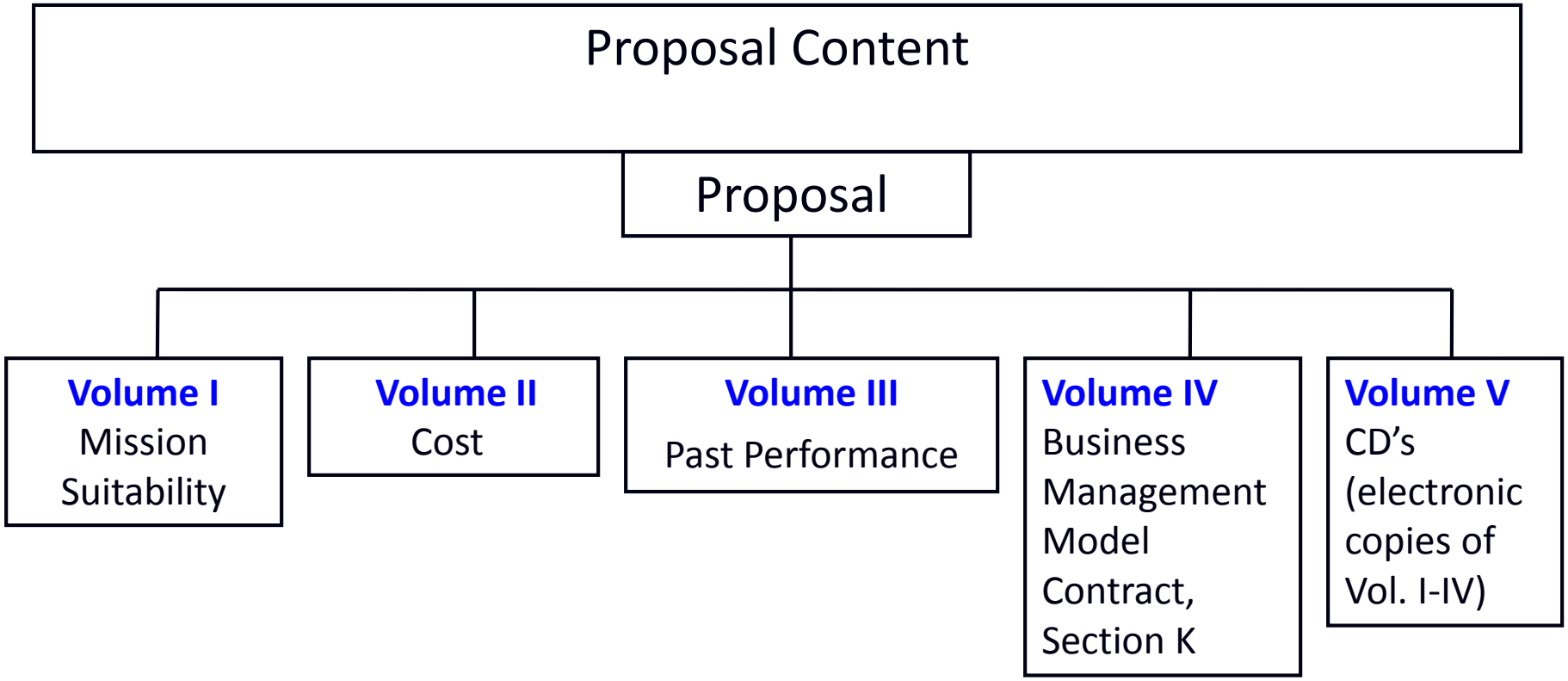
RFP Overview - Evaluation Criteria

- The RTAPS evaluation will have three factors:
  - Mission Suitability
  - Cost/Price
  - Past Performance
- Mission Suitability is more important than Past Performance which is more important than Cost. When combined, Past Performance and Cost are less important than Mission Suitability.

PROPOSAL PREPARATION

Bernadette Kan

Proposal Preparation

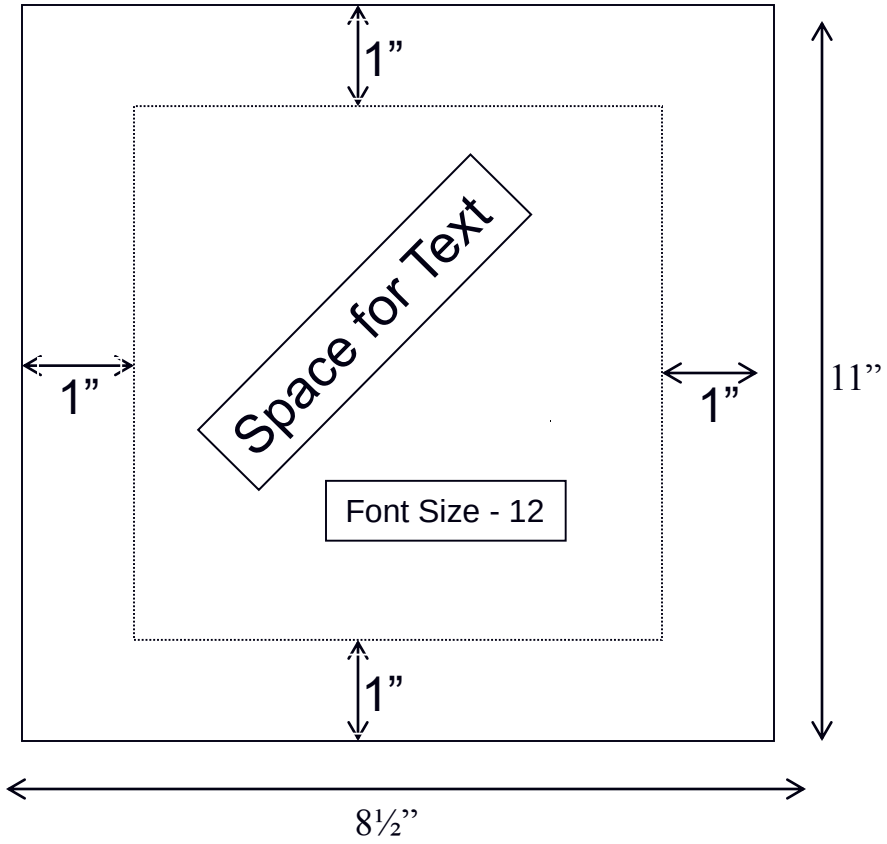


Proposal Preparation

Page Limits

Volume	Volume Title	Page Limit
I	Mission Suitability – Technology Area 1	90
I	Mission Suitability –Technology Area 2	70
I	Mission Suitability – Technology Area 3	40
I	Mission Suitability – Technology Area 4	40
I	Technical Summary	300 words. See L-21. Not in page limit
I	Letters of Intent with Major Subcontractors	No Limit
I	Government Property Information L.19	No Limit
I	Small and Small Disadvantaged Business Subcontracting Plan and Attachment L-1	No Limit
II	Price/Cost	No Limit
III	Past Performance	25
IV	Business Management	5
IV	Signed Model Contract, SF 33 and Section K Certifications	No Limit
V	All CD's submitted in this Volume V	No Limit

Proposal Preparation
Page Format



- Foldouts count as equivalent number of “8 ½ X 11” pages.
- Separators (e.g., tabs and titles) will not be counted as page.
- Summary addendums will not be counted as page.

Proposal Preparation

See Provision L.16

- Proposal Format - **All Volumes** – Submitted in hard copy and on CD. No PDF files, Microsoft Office software.

See provision L.16 for submission requirements.

Proposal Preparation

Proposal Preparation - Mission Suitability Volume I

(See Provision L.24)

- Mission Suitability consists of three sub-factors:
  - Subfactor 1: Understanding Technical Requirements - **500** points
  - Subfactor 2: Management Plan and Approach - **400** points
  - Subfactor 3: Small Business Utilization - **100** points

Proposal Preparation - Cost Proposal Volume II

(See Provision L.25)

- Cost/Price
  - Not numerically scored
  - A cost realism analysis of the proposed rates, §**H.24** and **Attachment J-E** will be performed in accordance with FAR 15.404-1(b)(2). Specifically, the evaluations will include, but are not limited to:
    - (i) comparing the Offerors' rates proposed in response to this solicitation and
    - (ii) comparing the proposed rates to historical rates for the same or similar items purchased by the Government.
- Electronic submission of cost data is required
- See Attachment J-E for Indirect cost templates

Proposal Preparation - Cost Proposal Volume II

(See Provision L.25)

- Systems Reviews and Status Information

Offerors are to provide for their companies: **(1)** the current status, **(2)** date of last review, and **(3)** name, address, and phone number of the governmental agency who performed the review for the system reviews and status information, and **(4)** the audit report number.

Proposal Preparation - Cost Proposal Volume II

(See Provision L.25)

- Accounting system- Offerors must demonstrate they have an adequate government approved accounting system before award, if not the contract cannot be awarded to the Offeror. L.25 1.(e)

- Proposal Page Limitations
  - Volume II – Cost Factor No page limit
  - Cost information only – No technical data

See provision L.16 for submission requirements

Proposal Preparation - Past Performance **Volume III** (See Provision L.26)

- Past Performance
  - Not numerically scored
  - Used to make assessment
    - How well Offeror is likely to perform
  - Government can use information submitted in proposal
  - As well as all other information gathered

- See Attachment L-2 (Questionnaire)

Proposal Preparation - Past Performance Volume III (See Provision L.26)

- Other elements considered
  - Past contracts terminated or de-scoped
  - Past working relationships
  - Demonstrated work accomplishment of similar work
  - Commitment to small business, small disadvantaged subcontracting goals and type of work subcontracted
  - Close attention should be given to section L.26

Proposal Preparation - Past Performance Volume III (See Provision L.26)

- Early Submission of Past Performance Information
  - Early submission of past performance information is requested
  - Submit per L.17 to contracting officer no later than two weeks before proposal due date
  - February 19, 2015 (2 wks prior to proposals)

Proposal Preparation - Business Management Volume IV
(See Provision L.27)

- Model Contract
- Representations and Certifications
- Standard Form 33 (Solicitation, Offer and Award)
- Listing of exceptions and deviations taken to the RFP will be included in this volume
- Fill-ins required for Section B-I, Section J, Section K

Proposal Preparation - CD Volume V (See Provision L.28)

- All CDs (original + back up) shall be placed in Volume V.

- A cover page shall accompany this volume identifying all CDs (original + back up).

- Prime contractor is responsible for sending in their CDs and their subcontractors.

Proposal Presentation

Small Business Goals

Small Business Subcontracting Type	Technology Area 1- Air Breathing Propulsion Technology	Technology Area 2- Space Propulsion	Technology Area 3- Aeronautical Communications	Technology Area 4- Space Communications
Small Business	3.0%	25.0%	3.0%	18.0%
SDB	4.0%	10.0%	4.0%	10.0%
WOSB	4.0%	10.0%	1.0%	10.0%
HBCU/MI	1.0%	1.0%	1.0%	1.0%
HUBZone	1.0%	1.0%	1.0%	1.0%
VOSB	2.0%	1.0%	2.0%	1.0%
SDVOSB	1.0%	1.0%	1.0%	1.0%

Proposal Preparation - List of Required Plans

- Small and Small Disadvantaged Business Subcontracting Plan – See L.24 Subfactor 3
- Government Property Information – See L.19
- IT Security Management Plan – due 30 days after contract award

TASK ORDER PROCESS

Task Order Process

Task Order Minimum/Maximum

- Each contract awarded will receive task orders valued at $30,000 – minimum quantity

- Maximum quantity will be contract value based on technology areas awarded

Task Order Process

Contract Task Order Process

- After Contract Award
  - All tasks over $3,000.00 to be competed among Contractors awarded in specific Technology area(s)
  - Exceptions to competition:
    - **urgency, highly specialized service, logical follow-on, minimum order**
  - Clause H.7 Fair Opportunity Ordering Process, Clause H.8 Task Order Solicitation and Selection Procedures, and Clause H.9 Task Ordering Procedure will apply after contract award

Task Order Process

Contract Task Order Process- Clause H.8 will allow:

- A task order resulting from the Aeronautics Research Mission Directorate (ARMD) NASA Research Announcement (NRA) selections.
  - Aeronautics Research Mission Directorate (ARMD) NASA Research Announcement (NRA) selections will be deemed to have already had competition so long as the ARMD NRA was competitively solicited.
  - In order for a ARMD NRA selection to be issued as a task under this task ordering procedure, the scope of work under the ARMD NRA selection must be included in the scope of work under the RTAPS2 scope of work
- Provide the capability for the NASA Glenn Research Center to issue task orders in support of teaming arrangements made in response to Announcements of Opportunity issued by NASA Headquarters as well as the various Program and Project offices.

Task Order Process

Contract Administration

- All costs associated with the planning and preparation of competed task order proposals are unallowable charges to the contract. See Clause – H.17.

- Other costs that are unallowable charges to the contract:
  - Annual Small Business subcontracting reporting through ESRS government system
  - Annual NASA Form (NF) 1018, NASA Property in the Custody of Contractors

Task Order Process

Contract Task Order Administration

- All task orders shall include:
  - Technical Reporting requirements (Monthly, Final, Special reporting) - See Attachment A
  - Financial Reporting 533M/533Q - See Clause G.4/G.5 and Attachment A
- Mixed Data Rights – See Clause H.21 (Cost sharing Tasks)
- Safety and Health- Plans maybe needed per task order.
- Contract Value Surge- See Clause H.23.
- Capital Asset Reporting – See Clause G.16 (Capital Assets)

Task Order Process

Contract Task Order Administration

- Upon completion of task order - Contractor Performance Assessment Reporting (CPAR) will be prepared
  - Evaluation of contractor performance
  - Contractor will be provided opportunity to review
  - Will be used in future task evaluation

Draft Schedule

Action	Date
Sources Sought	August 26, 2014
Issue Draft RFP	December 17, 2014
Industry Day	January 22, 2015
Draft RFP Comments Due	January 19, 2015
Issue Final RFP	February 3, 2015
Past Performance Due	February 19, 2015
Proposals Due	March 3, 2015
Contract Awards	August 3, 2015

Reminders

Draft solicitation has been posted to NAIS and Federal Business Opportunities

- **This is a draft document and is subject to change during development of the final document**

All questions must be submitted in writing to ensure accuracy and minimize confusion.

- For those attendees using WebEx, written questions may be submitted using “chat” and sent to Jana Van Horn
- For on-site attendees, written questions may be submitted on index cards provided
- Questions may also be submitted by e-mail to bernadette.j.kan@nasa.gov

Thank you for attending today!

- Questions/Answers in response to the draft RFP will be posted to FEDBIZOPPS.

- We will post Questions and Answers from today's Industry Day to the RTAPS2 website: https://rtaps.grc.nasa.gov/rtaps2/ and to FEDBIZOPPS